

**Amendments to the claims:**

This listing of claims will replace all prior versions and listing of claims in the application.

1. (Currently Amended) A method for diagnosing faults in a system under test (SUT) having a plurality of components, the SUT having been tested by at least one system test, the method comprising:

generating a candidate diagnosis potentially responsible for all failing system tests; and

assigning a weight to the candidate diagnosis based on a combined unviolated utilization of the candidate diagnosis across all failing system tests, the weight thereby indicating a level of confidence that the candidate diagnosis is correct wherein the observed variability of the results of the system tests is defined by an observed variability of a pass-fail conflicted shared function.

2. (Original) The method of claim 1, wherein the effect of the combined unviolated utilization of the candidate diagnosis by failing system tests on the weight of the candidate diagnosis is limited by a mathematical governor.

3. (Original) The method of claim 1, wherein the weight of the candidate diagnosis is also based on a combined utilization of the candidate diagnosis by passing system tests.

4. (Original) The method of claim 3, wherein the effect of the combined utilization of the candidate diagnosis by passing system tests on the weight of the candidate diagnosis is limited by a mathematical governor.

5. (Original) The method of claim 1, wherein the weight of the candidate diagnosis is also based on an observed variability of the results of the system tests.

6. (Cancelled).

7. (Currently Amended) The method of claim ~~6~~1, wherein the observed variability of the pass-fail conflicted shared function is quantified by the number of passing system tests employing the pass-fail conflicted shared function.

8. (Original) The method of claim 7, wherein the effect of the number of passing system tests employing the pass-fail conflicted shared function on the weight of the candidate diagnosis is limited by a mathematical governor.

9. (Currently Amended) The method of claim ~~6~~1, wherein the observed variability of the pass-fail conflicted shared function is quantified by the number of failing system tests employing the pass-fail conflicted shared function.

10. (Original) The method of claim 9, wherein the effect of the number of failing system tests employing the pass-fail conflicted shared function on the weight of the candidate diagnosis is limited by a mathematical governor.

11. (Currently Amended) The method of claim 6 1, wherein the observed variability of the pass-fail conflicted shared function is quantified by the utilization of structural elements by the pass-fail conflicted shared function.

12. (Original) The method of claim 11, wherein the effect of the utilization of structural elements by the pass-fail conflicted shared function on the weight of the candidate diagnosis is limited by a mathematical governor.

13. (Currently Amended) The method of claim 1, wherein the weight of the candidate diagnosis is ~~also~~ based on an overall utilization ~~outside of a hitting set~~ of subcomponents of at least one of the components of the candidate diagnosis ~~by the at least one system test~~.

14. (Currently Amended) The method of claim 13, wherein only the utilization of the subcomponents ~~by~~ in passing system tests is considered.

15. (Original) The method of claim 14, wherein the effect of the utilization of the subcomponents of at least one of the components of the candidate diagnosis

by passing system tests on the weight of the candidate diagnosis is limited by a mathematical governor.

16. (Currently Amended) The method of claim 15, wherein only the utilization of the subcomponents by of failing system tests is considered.

17. (Original) The method of claim 16, wherein the effect of the utilization of the subcomponents of a least one of the components of the candidate diagnosis by failing system tests on the weight of the candidate diagnosis is limited by a mathematical governor.

18. (Original) The method of claim 1, wherein the weight of the candidate diagnosis is also based on the replacement cost of the components of the candidate diagnosis.

19. (Original) The method of claim 18, wherein the effect of the replacement cost of the components of the candidate diagnosis on the weight of the candidate diagnosis is limited by a mathematical governor.

20. (Original) The method of claim 1, wherein the weight of the candidate diagnosis is also based on the failure rate of the components of the candidate diagnosis.

21. (Original) The method of claim 20, wherein the effect of the failure rate of the components of the

candidate diagnosis on the weight of the candidate  
diagnosis is limited by a mathematical governor.

22. (Currently Amended) A method for diagnosing faults in a system under test (SUT) having a plurality of components, the SUT having been tested by at least one system test, the method comprising:

generating a candidate diagnosis potentially responsible for a failing system test; and

assigning a weight to the candidate diagnosis based on a combined utilization of the candidate diagnosis by passing system tests, the weight thereby indicating a level of confidence that the candidate diagnosis is correct wherein the observed variability of the results of the system tests is defined by an observed variability of a pass-fail conflicted shared function.

23. (Original) The method of claim 22, wherein the effect of the combined utilization of the candidate diagnosis across passing system tests on the weight of the candidate diagnosis is limited by a mathematical governor.

24. (Original) The method of claim 22, wherein the weight of the candidate diagnosis is also based on an observed variability of the results of the system tests.

25. (Cancelled).

26. (Currently Amended) The method of claim 25 22, wherein the observed variability of the pass-fail conflicted shared function is quantified by the number

of passing system tests employing the pass-fail conflicted shared function.

27. (Original) The method of claim 26, wherein the effect of the number of passing system tests employing the pass-fail conflicted shared function on the weight of the candidate diagnosis is limited by a mathematical governor.

28. (Original) The method of claim 27, wherein the observed variability of the pass-fail conflicted shared function is quantified by the number of failing system tests employing the pass-fail conflicted shared function.

29. (Original) The method of claim 28, wherein the effect of the number of failing system tests employing the pass-fail conflicted shared function on the weight of the candidate diagnosis is limited by a mathematical governor.

30. (Original) The method of claim 25, wherein the observed variability of the pass-fail conflicted shared function is quantified by the utilization of structural elements by the pass-fail conflicted shared function.

31. (Original) The method of claim 30, wherein the effect of the utilization of structural elements by the pass-fail conflicted shared function on the weight

of the candidate diagnosis is limited by a mathematical governor.

32. (Currently Amended) The method of claim 22, wherein the weight of the candidate diagnosis is ~~also~~ based on an overall utilization ~~outside of a hitting set~~ of subcomponents of at least one of the components of the candidate diagnosis ~~by the at least one system test~~.

33. (Currently Amended) The method of claim 32, wherein only the utilization of the subcomponents ~~by~~ of passing system tests is considered.

34. (Original) The method of claim 33, wherein the effect of the utilization of the subcomponents of at least one of the components of the candidate diagnosis by passing system tests on the weight of the candidate diagnosis is limited by a mathematical governor.

35. (Currently Amended) The method of claim 32, wherein only the utilization of the subcomponents ~~by~~ of failing system tests is considered.

36. (Currently Amended) The method of claim 35, wherein the effect of the utilization of the subcomponents of at least one of the components of the candidate diagnosis by failing system tests on the weight of the candidate diagnosis is limited by a mathematical governor.



37. (Original) The method of claim 22, wherein the weight of the candidate diagnosis is also based on the replacement cost of the components of the candidate diagnosis.

38. (Original) The method of claim 37, wherein the effect of the replacement cost of the components of the candidate diagnosis on the weight of the candidate diagnosis is limited by a mathematical governor.

39. (Original) The method of claim 22, wherein the weight of the candidate diagnosis is also based on the failure rate of the components of the candidate diagnosis.

40. (Original) The method of claim 39, wherein the effect of the failure rate of the components of the candidate diagnosis on the weight of the candidate diagnosis is limited by a mathematical governor.

41. (Currently Amended) A method for diagnosing faults in a system under test (SUT) having a plurality of components, the SUT having been tested by at least one system test, the method comprising:  
generating a candidate diagnosis potentially responsible for a failing system test: and  
assigning a weight to the candidate diagnosis based on an observed variability of the results of the system tests, the weight thereby indicating a level of confidence that the candidate diagnosis is correct  
wherein the observed variability of the results of the system tests is defined by an observed variability of a pass-fail conflicted shared function.

42. (Cancelled).

43. (Currently Amended) The method of claim ~~42~~ 41, wherein the observed variability of the pass-fail conflicted shared function is quantified by the number of passing system tests employing the pass-fail conflicted shared function.

44. (Original) The method of claim 43, wherein the effect of the number of passing system tests employing the pass-fail conflicted shared function on the weight of the candidate diagnosis is limited by a mathematical governor.

45. (Currently Amended) The method of claim ~~42~~ 41, wherein the observed variability of the pass-fail

conflicted shared function is quantified by the number of failing system tests employing the pass-fail conflicted shared function.

46. (Original) The method of claim 45, wherein the effect of the number of failing system tests employing the pass-fail conflicted shared function on the weight of the candidate diagnosis is limited by a mathematical governor.

47. (Currently Amended) The method of claim ~~42~~ 41, wherein the observed variability of the pass-fail conflicted shared function is quantified by the utilization of structural elements by the pass-fail conflicted shared function.

48. (Original) The method of claim 47, wherein the effect of the utilization of structural elements by the pass-fail conflicted shared function on the weight of the candidate diagnosis is limited by a mathematical governor.

49. (Currently Amended) The method of claim 41, wherein the weight of the candidate diagnosis is ~~also~~ based on an overall utilization ~~outside of a hitting set~~ of subcomponents of a least one of the components of the candidate diagnosis ~~by the at least one system test~~.

50. (Original) The method of claim 49, wherein only the utilization of the subcomponents by passing system tests is considered.

51. (Original) The method of claim 50, wherein the effect of the utilization of the subcomponents of at least one of the components of the candidate diagnosis by passing system tests on the weight of the candidate diagnosis is limited by a mathematical governor.

52. (Original) The method of claim 49, wherein only the utilization of the subcomponents by passing system tests is considered.

53. (Original) The method of claim 52, wherein the effect of the utilization of the subcomponents of at least one of the components of the candidate diagnosis by failing system tests on the weight of the candidate diagnosis is limited by a mathematical governor.

54. (Original) The method of claim 41, wherein the weight of the candidate diagnosis is also based on the replacement cost of the components of the candidate diagnosis.

55. (Original) The method of claim 54, wherein the effect of the replacement cost of the components of the candidate diagnosis on the weight of the candidate diagnosis is limited by a mathematical governor.

56. (Original) The method of claim 41, wherein the weight of the candidate diagnosis is also based on the failure rate of the components of the candidate diagnosis.

57. (Original) The method of claim 56, wherein the effect of the failure rate of the components of the candidate diagnosis on the weight of the candidate diagnosis is limited by a mathematical governor.

58.- 66. (Cancelled)

67.-70. (Cancelled)

71. (Currently Amended) A program storage medium readable by a computer system, embodying a program executable by the computer system to perform method steps for diagnosing faults in a system under test (SUT) having a plurality of components, the SUT having been tested by at least one system test, the method steps comprising:

generating a candidate diagnosis potentially responsible for a failing system test; and

assigning a weight to the candidate diagnosis based on a combined unviolated utilization of the candidate diagnosis across failing system tests; the weight thereby indicating a level of confidence that the candidate diagnosis is correct wherein the observed variability of the results of the system tests is defined by an observed variability of a pass-fail conflicted shared function.

72. (Currently Amended) A program storage medium readable by a computer system, embodying a program executable by the computer system to perform method

steps for diagnosing faults in a system under test (SUT) having a plurality of components, the SUT having been tested by at least one system test, the method steps comprising:

generating a candidate diagnosis potentially responsible for a failing system test; and

assigning a weight to the candidate diagnosis based on a combined utilization of the candidate diagnosis by passing system tests; the weight thereby indicating a level of confidence that the candidate diagnosis is correct wherein the observed variability of the results of the system tests is defined by an observed variability of a pass-fail conflicted shared function.

73. (Cancelled)

74. (Cancelled).